Bilateral Primary Breast Cancer: A Case Report and Literature Review

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Case report

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Abstract

Background

Invasive micropapillary carcinoma (IMPC) and secretory carcinoma of the breast (SCB) are relatively rare types of breast cancer. IMPC is usually associated with high incidence of lymphovascular invasion, lymph node metastasis and poor prognosis. While SCB usually carries a relatively favorable prognosis, cases of axillary and distant metastases have been reported. Clinicians generally adopt systemic treatments based on the histopathological findings of the patients to improve the prognosis, but there is currently no consensus on the optimal treatment for these two types of cancer.

Case presentation

We treated a 50-year-old woman with lung cancer history who presented with a single lump in each breast. Following bilateral breast-conserving surgery, the diagnosis of SCB of the left breast and IMPC of the right breast was confirmed with immunohistochemistry. It is worth noting that the pathological results of left lung adenocarcinoma centered on micropapillary-type was same as the invasive micropapillary component of right breast.

Conclusions

We reported this case of bilateral primary relatively-rare-form breast cancer for its extremely rare occurrence and there are less than 20 cases of SCB reported worldwide till now. It is also significative to distinguish this primary tumor of right breast from metastatic cancer. Our histopathologic diagnosis and synthetical therapy scheme will provide material for SCB and IMPC. To facilitate the diagnosis and prognosis of such relatively rare tumors, more cases will need to be reported.

Introduction

Invasive micropapillary carcinoma (IMPC) is a special subtype of invasive ductal carcinoma of the breast (IDC), which accounts for 2–8% of all breast cancers (1). IMPC is commonly encountered in middle-aged and elderly women, and does not differ significantly from IDC in terms of the median age of the patients (2–5). Previous studies have demonstrated that IMPC has a higher propensity for lymph node and vascular invasion, higher local recurrence rate and worse prognosis compared with IDC (2, 4–5). Due to the relatively low incidence of this disease and its poor prognosis, no consensus has yet been reached regarding the diagnosis, treatment and prognosis evaluation of patients with IMPC.

SCB is an extremely rare histological subtype of infiltrating breast malignancy, accounting for < 0.02% of all breast cancers (6). This disease was first reported in 1966 as a juvenile breast carcinoma occurring in young children (7), but the majority of the cases have since been reported more frequently in adults (8). Moreover, compared with IDC, although the patients are more likely to be female, rare cases have also been reported in men (6, 9, 10). Its unique histopathological characteristics suggest that SCB is a low-

grade malignant tumor, with a generally slow progression and favorable prognosis, but there is a risk of long-term recurrence (6, 9, 11).

We herein report a case of primary IMPC of the right breast and concurrent SCB of the left breast occurring in a 50-year-old female patient. Furthermore, in order to further improve our understanding of these two types of breast cancer, the related literatures with clinical cases was reviewed, and their clinical characteristics, diagnosis and treatment were discussed.

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Case Presentation

A 50-year-old woman without family history of breast cancer visited Zhejiang Provincial Hospital of TCM in September 2019 for treatment due to bilateral breast lumps found on her recent routine health check. The patient underwent video-assisted thoracoscopic surgery for left lung cancer at Shanghai Ruijin Hospital in January 2019. The pathological results indicated left lung adenocarcinoma centered on micropapillary-type.

On physical examination, a superficial, smooth mass was detected in the inner quadrant of the left breast, measuring ~ 1.5 cm. There was no palpable mass in the right breast or enlarged axillary lymph nodes. Breast ultrasonography revealed an irregularly shaped mass of the right breast (Fig. 1A), with blurry borders and multiple fine, strongly echogenic dots inside, as well as an oval-shaped, hypoechoic mass with clear and smooth borders in the left breast (Fig. 1B). Magnetic resonance imaging (MRI) examination of the right breast (Fig. 2A) demonstrated an upper-quadrant, irregularly shaped lesion exhibiting restricted diffusion, heterogeneous internal enhancement configuration, with a time-signal curve of the plateau type, while the regular, round lump in the left breast (Fig. 2B) exhibited unrestricted diffusion, internal irregular rim enhancement, with a time-signal curve of the mild-washout type. The comprehensive assessment results of breast imaging reporting and data system (BI-RADS) classification method were defined as BI-RADS 5 and BI-RADS 4. Thus, based on the findings of the clinical examination mentioned above, the right tumor was initially diagnosed as malignant and the left one as a non-aggressive tumor.

Wide local excision and right sentinel lymph node biopsy (SLNB) were performed, and the fast-frozen pathological examination of resected specimens revealed invasive carcinoma of the right breast and an ill-defined tumor of the left breast. After 1 week, however, the conventional histopathological examination diagnosed the right tumor as IMPC (Fig. 3) and the left tumor as SCB (Fig. 4). On immunohistochemical staining, the cells of the right tumor were positive for human epidermal growth factor receptor 2 (HER-2) and negative for estrogen receptor (ER). In addition, a micrometastasis was detected in the sentinel lymph node (Fig. 5). The cells of the left tumor were found to be positive for S-100 and ER, and negative for HER-2. In view of the existence of ductal carcinoma in situ component in the right tumor, we do not consider it to be a lung metastasis. The patient was called in and left SLNB was performed.

The overall postoperative course was uneventful and the patient was discharged on postoperative day 5. The patient has completed adjuvant chemotherapy with EC-T (four cycles of cyclophosphamide and epirubicin, followed by four cycles of docetaxel) and adjuvant radiation therapy after chemotherapy completion. Follow-up examination at one year postop showed no evidence of recurrence by physical exam or ultrasound.

Discussion

IMPC of the breast was defined by the World Health Organization in 2012 as a morphologically distinct form of mammary carcinoma consisting of small, hollow, and morula-like tumor cells, characterized by reversed polarity of the tumor cells and a space between the cancer cells and the stroma (12).

As mentioned in a number of case reports, IMPC and common invasive breast cancer appear to have no significant differences in terms imaging characteristics, and they are difficult to distinguish based on clinical presentation and imaging findings alone. Yoon *et al* (3) conducted a study including 308 matching cases of IMPC and IDC, and found that the IMPC group had more angular or indistinct lesion margins, while in the IDC group the margins appeared more spiculated. Imaging examination is only an auxiliary examination method without characteristic findings. The final diagnosis is based on pathological examination, which is deemed to be the gold standard.

Compared with IDC, IMPC displays a more distinctive architecture. It is composed of small, hollow or morula-like clusters of cancer cells, surrounded by clear stromal spaces. The neoplastic cells characteristically display a reverse polarity, also referred to as an 'inside-out' growth pattern, whereby the apical pole of the cells faces the stroma rather than the luminal surface (5). There is yet no consensus on the percentage of micropapillary architecture in a tumor required for a diagnosis of IMPC. Yang *et al* (5) considered that, for an IDC to be classified as pure IMPC, the micropapillary component should comprise at least 75% of the tumor. Pure IMPCs are rarely seen, and most tumors are mixed with other types. Chen *et al* (4) and Ide *et al* (13) observed that the tendency towards recurrence and metastasis is not associated with the proportion of the IMPC component, as the frequencies of lymphovascular invasion (LVI) and lymph node metastasis (LNM) in breast cancer with a minimal IMPC component were significantly higher compared with those without an IMPC component. Furthermore, the incidence of LVI and LNM in breast cancer with a high proportion of IMPC resemble that in tumors with a low proportion. These findings indicate that the presence of an IMPC component *per se* is a crucial factor affecting prognosis, rather than the extent. Therefore, even minor IMPC-like structures should be evaluated accurately during pathological examination and used to guide clinical treatment.

Tumors containing an IMPC component tend to present with a larger size, higher TNM stage and earlier LVI (2, 4–5, 14). Extensive axillary lymph node involvement may be found in most breast cancer patients at the first clinical visit. In the present case, although the maximum diameter of the right tumor was only ~ 1 cm, the micrometastasis in the sentinel node identified on pathological examination constitutes evidence supporting the point mentioned above. In addition, an IMPC case encountered recently as an

outpatient had already received surgical treatment, with confirmed involvement of eight lymph nodes. Ye *et al* (15) analyzed 1,407 patients with IMPC and concluded that larger lesions, younger age at diagnosis, and lack of hormone receptor expression were significantly associated with regional nodal involvement.

At present, standard IDC treatment is employed to treat IMPC. Due to the higher risk of LNM and recurrence in patients with IMPC, treatment should include wide surgical margins and adequate lymph node dissection, and conventional radiation therapy is considered to improve postoperative outcomes (16). Several prior studies (14–17) reported the high rate of positivity of IMPC to ER, progesterone receptor (PR) and HER-2, which may indicate effectiveness of active endocrine therapy. Chen *et al* (4) reviewed 100 cases of invasive breast carcinoma with an IMPC component. Statistical analysis confirmed the positive effect of tamoxifen endocrine therapy and chemotherapy, while neoadjuvant chemotherapy did not improve the survival rate in patients who received both preoperative and postoperative chemotherapy compared with patients who only received postoperative adjuvant chemotherapy. Yu *et al* (18) reported a greater degree of locoregional recurrence in the axilla and supraclavicular areas in a matched case-control study, stressing that axillary and supraclavicular radiation therapy should be considered in IMPC patients with axillary node metastasis. In the present case, the immunohistochemical staining results of the IMPC lesion revealed no indication for endocrine therapy; thus, active chemotherapy and targeted therapy were recommended for our patient.

As the number of published reports is limited, there is yet no consensus with regard to the prognosis assessment of IMPC. In 2008, Chen *et al* (4) found that tumor size, proportion of the IMPC component, histological grade and LNM were not significantly correlated with survival rate, but the follow-up results demonstrated poorer 5-year and 10-year survival rates compared with IDC not otherwise specified. In 2014, based on the largest retrospective analysis (19) of 636 IMPC and 297,735 IDC cases, IMPC had favorable disease-specific survival and overall survival (OS) compared with IDC, and the authors reported that ER positivity may be a major contributor to the survival advantage. Yu *et al* (20) in 2015 reported the largest comparative study of IMPC and IDC adopting a counter-factual model. The 5-year and 10-year OS rates did not differ significantly, but the locoregional relapse-free survival rate exhibited a notable difference, particularly after 2 years. A 12-year prospective clinical study (21) proposed that accurate pathological diagnosis and individualized treatment may improve the disease-free survival and OS of patients with IMPC.

In summary, as a special type of IDCs, IMPC displays a propensity for aggressiveness and is generally considered as a worse prognostic indicator, and annual breast cancer screening and targeted treatments are deemed necessary. With the increased awareness for IMPC, early detection and treatment can significantly improve patient survival.

The 2012 WHO Classification of Tumors of the Breast defined SCB as a rare, low-grade translocation-associated invasive carcinoma (12). Imaging examinations as individual tests have high rates of misdiagnosis, as SBC may mimic benign breast tumors on mammography and ultrasound images (11, 22). This makes it difficult to distinguish SCB from other types of breast cancer, or even fibroadenoma. In

the present case, ultrasound examination revealed a mass of the left breast with an oval shape and smooth borders, while the MRI demonstrated unrestricted diffusion. Based on the findings mentioned above and physical examination, the initial diagnosis leaned towards a fibroadenoma.

The final diagnosis of SCB depends on histology, immunohistochemistry and cytogenetics. Microscopically, all specimens display distinct pathological characteristics and abundant secretory material positive for Periodic acid-Schiff stain inside or outside the cancer cells. The tumors are usually positive for p53 and carcinoembryonic antigen, and strongly positive for S-100 (22–23). In 2002, Tognon *et al* (24) first reported that SCB was characterized by expression of the t(12;15)-associated ETV6-NTRK3 fusion gene. This fusion gene would encode a chimeric tyrosine kinase with potent transforming activity in fibroblasts. This mechanism was later confirmed by other researchers (21, 25, 26). SCB has been found to be negative for ER and PR, with absence or presence of HER-2 amplification, displaying an immunophenotype similar to that of triple-negative breast cancer (27). However, unlike most statistical analyses of clinicopathological results, higher positivity rates of ER and PR are frequently found over recent years (24). A majority of SCBs present a low proliferation index, lacking increased Ki-67 expression. The relatively low value of the Ki-67 index suggests that this is an indolent malignant tumor.

As SCB is one of the rarest types of breast cancer, no comprehensive treatment plan has yet been agreed upon. It is commonly believed that the primary treatment of SCB should be surgical excision, while there is no consensus regarding the extent of surgery. At an early stage, some experts consider mastectomy plus axillary lymph node dissection as the preferred surgical procedure for SCB. The application of breast-conserving surgery and SLNB has been increasingly advocated by clinicians in recent years, particularly for prepubescent women. Ozguroglu *et al* (28) reviewed 121 cases of SBC, of which 61 underwent surgery, including 20 cases of modified radical mastectomy, 12 cases of radical mastectomy, 17 cases of mastectomy and 12 cases of wide local excision, and demonstrated that the results of wide local excision did not differ significantly from those of other surgical procedures. Shui *et al* (29) suggested that, if the size of the primary tumor is < 2 cm, axillary metastasis is uncommon. Li *et al* (21) believed that breast-conserving surgery and SLNB can only be performed on those patients whose primary tumors are sized < 2 cm and have no axillary LMN. Therefore, we recommend mastectomy or modified radical mastectomy for patients with tumors larger than 2 cm in diameter, and consider aggressive SLNB to be crucial.

Due to the rarity of SCB, the efficacy of neoadjuvant chemotherapy, adjuvant chemotherapy and postoperative radiotherapy has not been confirmed by enough clinical studies to date. Soyar *et al* (30) suggested that patients with primary tumors > 2 cm in diameter should receive axillary lymph node dissection, combined with radiation therapy and chemotherapy. Although previous studies have reported non-response of SCB to chemotherapy (31), in a case report published in 2015, a 13-year-old male patient diagnosed with SCB with metastasis to a single lymph node received chemotherapy with adriamycin and cyclophosphamide for 6 cycles after radical mastectomy, and he has remained disease-free over a 10-year follow-up. ER and PR are negative in most cases of SCB, so there is currently no report on the efficacy of endocrine therapy.

As a low-grade carcinoma, SCB has an indolent course and good long-term survival. The prognosis is generally considered to be better in children and adolescents, relatively poor in adults, and distant metastasis is rarely observed (32, 33). Axillary lymph node involvement has been reported in 30% of the cases (33), particularly those with primary tumors > 2 cm in diameter. The number of axillary metastatic lymph nodes is generally < 3, whereas > 3 positive lymph nodes may indicate risk of distant metastasis and poor prognosis (34). Local recurrence and distant metastasis have been reported 12, 16 and 20 years after routine surgical treatment; thus, we recommend extending follow-up even up to 20 years (29, 31, 35, 36).

In conclusion, both IMPC and SCB are uncommon types of breast cancer. In the case presented herein, the findings on the right side indicate a tumor with an unfavorable outcome, with a sentinel lymph node micrometastasis identified at an early stage, while the findings on the left side indicate an inert tumor with good prognosis, although long-term recurrence cannot be ruled out.

With accurate diagnosis based on histopathological examination of the tumors, active individualized therapies and more rigorous management may help improve the prognosis of patients and long-term survival rates. Routine adjuvant chemotherapy after breast-conserving surgery is commonly adopted, while there are not enough studies on the selection of chemotherapy regimens for IMPC and SCB, or the effects of different regimens on prognosis. Related reports on radiotherapy are also sparse. As the special mechanism of balanced translocation t(12;15) and ETV6-NTRK3 gene fusion is characteristic in SCB, we aim to further explore the tyrosine kinase inhibitor in future studies.

Declarations

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Declarations

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Authors' contributions: Fan SY conceived the idea, wrote the initial draft of the paper and sorted out the materials; Zhou CY, Mao YP and Liang ZH provided the data; Gu XD, Xie XH and Zhou CY contributed to the revisions.

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References

1. Siriaunkgul S, Tavassoli F. Invasive micropapillary carcinoma of the breast. *Mod Pathol*. 1993;6:660–2.
2. Hao S, Zhao YY, Peng JJ, Ren F, Yang WT, Yu KD, Shao ZM. Invasive micropapillary carcinoma of the breast had no difference in prognosis compared with invasive ductal carcinoma: a propensity-matched analysis. *Sci Rep*. 2019;9:286.
3. Yoon GY, Cha JH, Kim HH, Shin HJ, Chae EY, Choi WJ. Comparison of invasive micropapillary and invasive ductal carcinoma of the breast: a matched cohort study. *Acta Radiol*. 2019;60:1405–13.
4. Chen L, Fan Y, Lang RG, Guo XJ, Sun YL, Cui LF, Liu FF, Wei J, Zhang XM, Fu L. Breast carcinoma with micropapillary features: clinicopathologic study and long-term follow-up of 100 cases. *Int J Surg Pathol*. 2008;16:155–63.
5. Yang YL, Liu BB, Zhang X, Fu L. Invasive Micropapillary Carcinoma of the Breast: An Update. *Arch Pathol Lab Med*. 2016;140:799–805.
6. Jacob JD, Hodge C, Franko J, Pezzi CM, Goldman CD, Klimberg VS. Rare breast cancer: 246 invasive secretory carcinomas from the National Cancer Data Base. *J Surg Oncol*. 2016;113:721–5.
7. McDivitt RW, Stewart FW. Breast carcinoma in children. *JAMA*. 1966;195:388–90.
8. Ozguroglu M, Tascilar K, Ilvan S, Soybir G, Celik V. Secretory carcinoma of the breast. Case report and review of the literature. *Oncology*. 2005;68:263–8.
9. Cadoo KA, McArdle O, O'Shea AM, Power CP, Hennessy BT. Management of unusual histological types of breast cancer. *Oncologist*. 2012;17:1135–45.
10. Horowitz DP, Sharma CS, Connolly E, Gidea-Addeo D, Deutsch I. Secretory carcinoma of the breast: results from the survival, epidemiology and end results database. *Breast*. 2012;21:350–3.
11. Li LJ, Wu N, Li FX, Li LM, Wei LJ, Liu JT. Clinicopathologic and molecular characteristics of 44 patients with pure secretory breast carcinoma. *Cancer Biol Med*. 2019;16:139–46.
12. Frank GA, Danilova NV, Andreeva lulu, Nefedova NA. WHO classification of tumors of the breast, 2012. *Arkh Patol*. 2013;75:53–63.
13. Ide Y, Horii R, Osako T, Ogura K, Yoshida R, Iwase T, Akiyama F. Clinicopathological significance of invasive micropapillary carcinoma component in invasive breast carcinoma. *Pathol Int*. 2011;61:731–6.
14. Chen HL, Ding A. Comparison of invasive micropapillary and triple negative invasive ductal carcinoma of the breast. *Breast*. 2015;24:723–31.
15. Ye FG, Xia C, Ma D, Lin PY, Hu X, Shao ZM. Nomogram for predicting preoperative lymph node involvement in patients with invasive micropapillary carcinoma of breast: a SEER population-based study. *BMC Cancer* 18: 2018.
16. Wu Y, Zhang N, Yang QF. The prognosis of invasive micropapillary carcinoma compared with invasive ductal carcinoma in the breast: a meta-analysis. *BMC Cancer* 17: 2017.

17. Tang SL, Yang JQ, Du ZG, Tan QW, Zhou YT, Zhang D, Lv Q. Clinicopathologic study of invasive micropapillary carcinoma of the breast. *Oncotarget*. 2017;8:42455–65.
18. Yu JI, Choi DH, Park W, Huh SJ, Cho EY, Lim YH, Ahn JS, Yang JH, Nam SJ. Differences in prognostic factors and patterns of failure between invasive micropapillary carcinoma and invasive ductal carcinoma of the breast: matched case-control study. *Breast*. 2010;19:231–7.
19. Chen AC, Paulino AC, Schwartz MR, Rodriguez AA, Bass BL, Chang JC, Teh BS. Population-based comparison of prognostic factors in invasive micropapillary and invasive ductal carcinoma of the breast. *Br J Cancer*. 2014;111:619–22.
20. Yu JI, Choi DH, Huh SJ, Cho EY, Kim K, Chie EK, Ha SW, Park IA, Ahn SJ, Lee JS, et al. Differences in Prognostic Factors and Failure Patterns Between Invasive Micropapillary Carcinoma and Carcinoma With Micropapillary Component Versus Invasive Ductal Carcinoma of the Breast: Retrospective Multicenter Case-Control Study (KROG 13 – 06). *Clin Breast Cancer*. 2015;15:353–61.
21. Li W, Han Y, Wang C, Guo X, Shen B, Liu F, Jiang C, Li Y, Yang Y, Lang R, et al. Precise pathologic diagnosis and individualized treatment improve the outcomes of invasive micropapillary carcinoma of the breast: a 12-year prospective clinical study. *Mod Pathol*. 2018;31:956–64.
22. Pohlodek K, Mečiarová I, Grossmann P, Martínek P, Kinkor Z. Secretory carcinoma of the breast: A case report. *Int J Surg Case Rep*. 2019;56:74–7.
23. Osako T, Takeuchi K, Horii R, Iwase T, Akiyama F. Secretory carcinoma of the breast and its histopathological mimics: value of markers for differential diagnosis. *Histopathology*. 2013;63:509–19.
24. Tognon C, Knezevich SR, Huntsman D, Roskelley CD, Melnyk N, Mathers JA, Becker L, Carneiro F, MacPherson N, Horsman D, et al. Expression of the ETV6-NTRK3 gene fusion as a primary event in human secretory breast carcinoma. *Cancer cell*. 2012;2:367–76.
25. Del Castillo M, Chibon F, Arnould L, Croce S, Ribeiro A, Perot G, Hostein I, Geha S, Bozon C, Garnier A, et al. Secretory Breast Carcinoma: A Histopathologic and Genomic Spectrum Characterized by a Joint Specific ETV6-NTRK3 Gene Fusion. *Am J Surg Pathol*. 2015;39:1458–67.
26. Laé M, Fréneaux P, Sastre-Garau X, Chouchane O, Sigal-Zafrani B, Vincent-Salomon A. Secretory breast carcinomas with ETV6-NTRK3 fusion gene belong to the basallike carcinoma spectrum. *Mod Pathol*. 2009;22:291–8.
27. Anderson P, Albarracin CT, Resetskova E. A large, fungating breast mass. Secretory carcinoma with apocrine differentiation. *Arch Pathol Lab Med*. 2006;130:50–2.
28. Ozguroglu M, Tascilar K, Ilvan S, Soybir G, Celik V. Secretory carcinoma of the breast. Case report and review of the literature. *Oncology*. 2005;68:263–8.
29. Shui RH, Cheng YF, Bai QM, Yang WT. Secretory breast carcinoma with a papillary-predominant pattern: an unusual morphological variant. *Histopathology*. 2017;71:488–93.
30. Soyer T, Yaman Bajin İ, Orhan D, Yalçın B, Özgen Kiratlı P, Oğuz B, Karnak İ. Secretory breast carcinoma in a 6-year-old girl: mastectomy with sentinel lymph node dissection. *Pediatr Surg Int*. 2015;31:677–81.

31. Herz H, Cooke B, Goldstein D. Metastatic secretory breast cancer. Non-responsiveness to chemotherapy: case report and review of the literature. *Ann Oncol.* 2000;11:1343–7.
32. Vasudev P, Onuma K. Secretory breast carcinoma: unique, triple-negative carcinoma with a favorable prognosis and characteristic molecular expression. *Arch Pathol Lab Med.* 2011;135:1606–10.
33. Cabello C, Alvarenga M, Alvarenga CA, Duarte GM, Pereira PN, Marshall PS. Case report and review of the literature: secretory breast cancer in a 13-year-old boy–10 years of follow up. *Breast Cancer Res Treat.* 2012;133:813–20.
34. Lee SG, Jung SP, Lee HY, Kim S, Kim HY, Kim I, Bae JW. Secretory breast carcinoma: A report of three cases and a review of the literature. *Oncol Lett.* 2014;8:683–6.
35. Li D, Xiao X, Yang W, Shui R, Tu X, Lu H, Shi D. Secretory breast carcinoma: a clinicopathological and immunophenotypic study of 15 cases with a review of the literature. *Mod Pathol.* 2012;25:567–75.
36. Tixier H, Picard A, Guiu S, Coudert B, Loustalot C, Depret O, Arnould L, Cuisenier J. Long-term recurrence of secretory breast carcinoma with metastatic sentinel lymph nodes. *Arch Gynecol Obstet.* 2011;283:77–8.

Figures

Figure 1

Ultrasonography images of breast cancer. (A) Image of right breast showing an irregular mass, along with blurry border and multiple fine strong echogenic dots inside. (B) Image of left breast showing an oval mass with regular border and hypoecho.

Figure 2

MRI images of breast cancer. (A) Contrast-enhanced MRI image of right image showing an irregular lesion of upper quadrant with heterogeneous enhancement. (B) Contrast-enhanced MRI image of right breast showing a round mass of lower-inner-quadrant with unrestricted diffusion, internal irregular rim enhancement. (C) MIP (Maximum Intensity Projection) image showing bilateral breast lesions.

Figure 3

Histological findings of secretory breast carcinoma. (A) Tumor cells are arranged in acinar, stripe, and microcapsules of different sizes, with eosinophilic secretions observed inside (H&E stain, x200). (B) Secretory materials are positive for PAS (Periodic Acid-Schiff stain, x400). (C) S-100 protein staining is positive in the tumor cells (x200).

positive (S-100 antibody stain, x200). (D) Staining for CEA is positive (CEA stain, x200). (E) Staining for ER is negative (ER stain, x200). (F) Staining for HER-2 is negative (HER-2 stain, x200).

A

B

C

D

Figure 4

Histological findings of Invasive micropapillary carcinoma. (A) Staining for P120 membrane of the tumor cells is positive on the inner side and negative on the outer side, showing a polarity inversion (H&E stain, x400). (B-C) The clusters of tumor cells are micropapillary and seem to be suspended in the photic zone (H&E stain, x100). (D) Staining for HER-2 is positive (3+) (HER-2 stain, x200).

A

B

C

Figure 5

Sentinel lymph node (SLN) micrometastasis (H&E stain, A-x50; B-x200; C-x400).